



## State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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Dr. Arthur Lubin  
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Subject: Wisconsin REMAP Project

Dear Arthur:

The following are some of the benefits of the Wisconsin REMAP project will have on the assessment and management of Wisconsin's aquatic resources.

- 1) The project will help promote and institutionalize the use of probability-based monitoring and assessment of the aquatic resources in Wisconsin. Currently, the majority of stream assessment sites are chosen by WI DNR biologists using a targeted sampling approach, to answer questions regarding local management issues. While the data generated is of value for stream-specific management, the resulting datasets are biased and are of limited value when attempting to document broad-scale status or trends of natural resources. Although millions of dollars have been spent on stream assessment and management in the state, Wisconsin presently cannot rigorously document how the biological integrity of stream resources vary across the state or have changed over time, or are influenced by broad-scale land uses.

With 41,000 perennial streams and 22,000 perennial stream miles in Wisconsin, it is evident the State cannot census all streams in a timely fashion. A survey strategy using a probability-based sampling design needs to be implemented. Before water resource program administrators or local biologists will adopt this methodology, it is important to document the limitations of the current targeted sampling effort, and the utility of survey sampling designs. Since the sampling design used for the REMAP wadable streams project has direct application for many types of natural resources assessments and evaluations, the findings of the utility of this sampling design may foster the use of probability-based sampling in other programs within Wisconsin's Department of Natural Resources.

- 2) A second component of the REMAP project is to develop a multi-metric macroinvertebrate index for Wisconsin streams. Currently the WDNR primarily relies

on Hilsenhoff's Biotic Index (HBI) that was developed in Wisconsin in the late 1970s. While the HBI is a sensitive measure of organic pollution and has been adopted by numerous states and federal agencies, this metric is insensitive to other stressors that impact the state's streams (e.g. riparian degradation, sedimentation). A multi-metric will be developed using EPA methodologies that incorporates the HBI and additional metrics into a multi-metric index.

The macroinvertebrate field and lab methods currently employed by WI DNR produce data of unknown quality. Along with developing a macroinvertebrate index that is sensitive to the multiple stressors, it is important to document the performance characteristics of both field sampling and lab protocols used. It is essential to quantify field and lab protocols sensitivity, bias, and performance range. In a cooperative study with members of the National Water Quality's-Methods and Data Comparability Board, the WI REMAP project data will be used to compare Wisconsin's current (single riffle) macroinvertebrate field sample collection protocols, with the stream reach-length sampling protocols that are advocated by EPA-REMAP. The results of this component of the study will help WI DNR document the adequacy of the current field and lab protocols, and will help determine whether reach-length sampling increases data quality and should be incorporated by WI DNR. These findings will be used to illustrate a Performance Based Methods System (PBMS) framework that is applicable across the country for various types of field-sampling methods.

- 3) Lastly, multivariate analyses will be used to explore the major land cover and land use determinants of stream health. It is important to be able to set stream-quality expectations based on both ecoregional and broad-scale land use attributes. It is also imperative to document the impacts to stream resources caused by poor land use. Continued poor farming practices and poorly managed urban development continue to degrade a significant proportion of the State's waters. Recent changes in WI's nonpoint source pollution laws show some hope for improving land use practices. Clearly documenting the environmental costs of poor land use will help support and advance regulatory actions.

Sincerely,

Michael A. Miller - FH/3  
Monitoring and Data Analysis Section,  
Bureau of Fisheries Management and Habitat Protection